

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1 1. (Currently Amended) A digital signal processing system,
2 comprising:

3 a plurality of processor subsystems that each include:
4 at least one memory device; and
5 a memory bus multiplexer coupled to each of said at
6 least one memory device by a subsystem memory bus;
7 and
8 a direct memory access (DMA) controller,
9 wherein each of the DMA controllers is coupled to each of said
10 memory bus multiplexers of each of said plurality of
11 processor subsystems and is configured to access each of
12 said memory devices of each of said plurality of
13 processor subsystems via the corresponding subsystem
14 memory bus.

2. (Canceled)

1 3. (Currently Amended) The system of claim 1, wherein each of the
2 plurality of processor subsystems further includes:

3 a host port interface (HPI) unit coupled to the memory
4 bus multiplexer and configured to access the memory
5 device via the subsystem memory bus; and
6 wherein each of the HPI units is coupled to each of the memory
7 bus multiplexers of each of said plurality of processor
8 subsystems and is configured to access each of the memory
9 devices of each of said plurality of processor subsystems
10 via the corresponding subsystem memory bus.

4. (Canceled)

1 5. (Currently Amended) The A digital signal processing system, of
2 ~~claim 1~~, wherein ~~each of the plurality of processor subsystems~~
3 ~~further includes comprising~~:

4 a plurality of processor subsystems that each include:

5 at least one memory device; and

6 a memory bus multiplexer coupled to each of said at
7 least one memory device by a subsystem memory bus;
8 and

9 a direct memory access (DMA) controller,

10 an input/output peripheral coupled to the subsystem
11 memory bus,

12 wherein each of the DMA controllers is coupled to each of said
13 memory bus multiplexers of each of said plurality of
14 processor subsystems and is configured to access each of
15 said memory devices of each of said plurality of
16 processor subsystems via the corresponding subsystem
17 memory bus, and

18 wherein each of the DMA controllers is configured to access
19 each of the peripherals via the corresponding subsystem
20 memory bus.

1 6. (Currently Amended) The A digital signal processing system, of
2 ~~claim 4~~, wherein ~~each of the plurality of processor subsystems~~
3 ~~further includes comprising~~:

4 a plurality of processor subsystems that each include:

5 at least one memory device; and

6 a memory bus multiplexer coupled to each of said at
7 least one memory device by a subsystem memory bus;
8 and

9 a direct memory access (DMA) controller,

10 a host port interface (HPI) unit coupled to the memory
11 bus multiplexer and configured to access the memory
12 device via the subsystem memory bus; and
13 a remote access multiplexer coupled between the memory
14 bus multiplexer and all DMA controllers outside the
15 processor subsystem, wherein the remote access
16 multiplexer is further coupled between the memory
17 bus multiplexer and all HPI units outside the
18 processor subsystem,
19 wherein each of the DMA controllers is coupled to each of said
20 memory bus multiplexers of each of said plurality of
21 processor subsystems and is configured to access each of
22 said memory devices of each of said plurality of
23 processor subsystems via the corresponding subsystem
24 memory bus;
25 wherein each of the HPI units is coupled to each of the memory
26 bus multiplexers and is configured to access each of the
27 memory devices via the corresponding subsystem memory bus
28 wherein each of the HPI units is coupled to each of the
29 memory bus multiplexers and is configured to access each
30 of the memory devices via the corresponding subsystem
31 memory bus; and
32 wherein the memory bus multiplexer is configured to couple to
33 the memory bus at any one time exactly one of the HPI
34 unit, the DMA controller, and the remote access
35 multiplexer.

1 7. (Original) The system of claim 6, wherein each of the plurality
2 of processor subsystems further includes:

3 a remote access arbiter coupled to the remote access
4 multiplexer and configured to set the remote access
5 multiplexer to couple to the memory bus multiplexer at

6 any one time exactly one of the HPI units and DMA
7 controllers outside the processor subsystem.

1 8. (Original) The system of claim 6, wherein each of the plurality
2 of processor subsystems further includes:

3 a memory bus arbiter coupled to the memory bus multiplexer to
4 arbitrate between access requests received from the HPI
5 unit, the DMA controller, and the remote access
6 multiplexer, wherein said arbitration is performed on a
7 round-robin basis.

9. (Canceled)

1 10. (Currently Amended) A digital signal processor chip,
2 comprising:

3 a plurality of memory bus multiplexers, each of the memory bus
4 multiplexers is coupled to one or more corresponding
5 memory devices by a corresponding memory bus; and

6 a plurality of DMA controllers each coupled to each of the
7 plurality of memory bus multiplexers, each of the DMA
8 controllers is configurable to access each of the memory
9 devices via a corresponding one of the plurality of
10 memory bus multiplexers;

11 a plurality of memory bus arbiters each coupled to a
12 respective memory bus multiplexer, wherein each of the
13 plurality of memory bus arbiters is configured to set
14 their respective memory bus multiplexers to grant access
15 to the corresponding memory bus in response to one or
16 more access requests from the plurality of DMA
17 controllers;

18 a plurality of host port interface (HPI) units each coupled to
19 each of the plurality of memory bus multiplexers, and

20 each configured to access each of the memory devices via
21 a corresponding one of the plurality of memory bus
22 multiplexers; and
23 a plurality of memory bus arbiters each coupled to a
24 respective memory bus multiplexer, and each configured to
25 arbitrate between a local DMA controller, a local HPI
26 unit, and a remote access multiplexer for access to a
27 memory bus.

11 and 12. (Canceled)

1 13. (Currently Amended) The chip of claim ~~11~~ 10, further comprising
2 a plurality of memory bus arbiters each coupled to a respective
3 memory bus multiplexer, wherein each of the plurality of memory bus
4 arbiters is configured to set their respective memory bus
5 multiplexers to grant access to the corresponding memory bus in
6 response to one or more access requests from the plurality of DMA
7 controllers.

1 14. (Original) The chip of claim 13, wherein the arbiters are
2 further configured to resolve conflicts on a round-robin priority
3 basis and grant only one access request at a time.

15 and 16. (Canceled)

1 17. (Original) A multi-core digital signal processor, comprising:
2 a first processor subsystem that includes:
3 a first processor core;
4 a first memory device coupled to the first processor
5 core by a first instruction bus;
6 a first memory bus multiplexer coupled to the first
7 memory device by a first memory bus;

8 a first DMA controller coupled to the first memory bus
9 multiplexer and configured to control the first
10 memory bus to access the first memory device;
11 a first HPI unit coupled to the first memory bus
12 multiplexer and configured to control the first
13 memory bus to access the first memory device; and
14 a first remote access multiplexer coupled to the first
15 memory bus multiplexer; and
16 a second processor subsystem that includes:
17 a second processor core;
18 a second memory device coupled to the second processor
19 core by a second instruction bus;
20 a second memory bus multiplexer coupled to the second
21 memory device by a second memory bus;
22 a second DMA controller coupled to the second memory bus
23 multiplexer and configured to control the second
24 memory bus to access the second memory device;
25 a second HPI unit coupled to the second memory bus
26 multiplexer and configured to control the second
27 memory bus to access the second memory device; and
28 a second remote access multiplexer coupled to the second
29 memory bus multiplexer,
30 wherein the first DMA controller is coupled to the second
31 remote access multiplexer and is configured to control
32 the second memory bus to access the second memory device,
33 and
34 wherein the second DMA controller is coupled to the first
35 remote access multiplexer and is configured to control
36 the first memory bus to access the first memory device.

1 18. (Original) The processor of claim 17, wherein the first HPI
2 unit is coupled to the second remote access multiplexer and is

3 configured to control the second memory bus to access the second
4 memory device, and wherein the second HPI unit is coupled to the
5 first remote access multiplexer and is configured to control the
6 first memory bus to access the first memory device.

1 19. (Original) The processor of claim 17, further comprising a
2 first arbiter coupled to the first memory bus multiplexer and
3 configured to arbitrate between the first DMA controller, the first
4 HPI unit, and the first remote access multiplexer for control of
5 the first memory bus.